

Claim 8 is amended for clarity to remove the language “with which it corresponds”.

Claim 9 is amended to recite that the act of “performing alignments” is the act of aligning read pairs with a number of common subsequences according to sequence similarity. Support for this is found in paragraphs 0049 through 0051 of the specification.

Claims 10-12, 14, 16-17, and 21 are amended to clarify the Applicants’ use of “using”. Support for these changes is found in the specification in paragraphs 0049, 0052, 0059, and 0063 through 0066.

No new matter is introduced by these amendments.

### **Remarks**

Claims 1 - 21 were considered in the Office action of October 1, 2003. Claims 1 - 21 were rejected under 35 U.S.C. §112, second paragraph. The Examiner also objected to matters of form and order in the claims. In addition, the drawing were objected to as not having the same legend as described in the specification. Applicants address the objections and rejections below inasmuch as they may apply to the application as amended herein.

#### **1. Objections to the Drawings**

The Examiner objected to the drawings for failing to use the same figure legend as recited in the specification. In response, the Applicants amended the specification to include references to Fig. 3A and Fig. 3B. As such, Applicants submit that the objection to the drawings is obviated and request that the Examiner withdraw the objections.

#### **2. Rejections Under 35 U.S.C. § 112, second paragraph**

Claims 1 - 21 were rejected under 35 U.S.C. §112, second paragraph as being indefinite and for failing to particularly point out and distinctly claim the subject matter of the invention. In response, the Applicants have amended the claims described below to more clearly claim the subject matter of the invention.

The Examiner objected to claims 1 and 20 for reciting an “index” without reciting a basis for the index. Claims 1 and 20 are amended to recite that the “index” for the plurality of read subsequences is according to read number.

The Examiner similarly objected to the use of “index” in claim 6 as it related to the subsequence characteristic of length. Claim 6 is amended recite that the plurality of read subsequences be of a uniform, selected length. How the read subsequences are indexed is recited in claim 1 and further in claim 8.

Claim 8 is amended to recite that the subsequences are further indexed by starting position on the read.

In addition, the Examiner objected to the lack of sorting criteria specified in claim 4. Applicants amend Claim 4 to recite that sorting of the subsequences indexed in claim 1 is done alphabetically by subsequence.

Also, the Examiner objected to the use of the term “predetermined” with respect to the number of subsequences of the extracted read pairs. More, specifically, the Examiner asserted that since a step for determining length is not presented, one skilled in the art would not know what is intended. Applicants respectfully submit that the term “predetermined” is well-understood and that the repeated references to “predetermined” and the several examples in the specification of possible values for the subsequence length (including “preferably 24” at paragraph 0040) provide more than ample support for the plain and ordinary meaning of the term predetermined. Further, Applicants respectfully submit that the invention does not depend on a specific mode, basis, system or procedure for making a “predetermination” is required by Applicants’ invention, and that no further guidance for the plain and ordinary meaning of is therefore necessary. Factors that may determine subsequence length before the application of the invention include, but are not limited to, practitioner experience, company guidelines, or industry standards. Applicants contend that one skilled in the art would make, and know to make, the length-determining step at a point in time before the method of the invention. Nevertheless, solely in an effort of cooperation and not intending to abandon any subject matter whatsoever, Applicants have amended the claims to recite “selected” rather than “predetermined,” as suggested by the Examiner. Still, Applicants respectfully assert that

the substitution of predetermined with selected in no way narrows the scope of the present claims.

Claims 10-12, 14, 16-17, and 21 are amended to clarify the Applicant's use of "using". Specifically, Applicants have amended claim 10, to recite "comparing the associated position on the reads with which the subsequences correspond to verify overlap". Applicants have amended claim 11 to recite what "linking information" comprises; that the method determines the linking information of the plurality of reads- and of the plurality of merged read pairs; and that the plurality of reads and merged reads are compared for consistency. Claim 12 is similarly amended to specify: what "linking information" comprises; that the method determines the linking information of the plurality of reads and of the plurality of merged read pairs; and that the method can identify an ambiguity by comparing the linking information of plurality of reads and of the merged read pairs.

Finally, Applicants have amended claims 14, 16, 17, and 21 to recite linking pairs of unique regions "according to" the linking information associated with reads in the unique regions.

Applicants respectfully submit that, as amended, the drawings, specification and claims have obviated or overcome the Examiner's objections and rejection, and thus Applicants respectfully request that the Examiner reconsider and withdraw the objection and rejections.

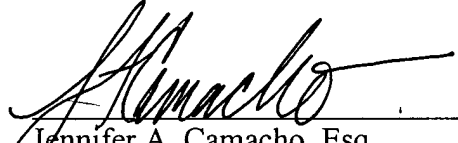
**Conclusion**

In view of the above amendments and remarks, Applicants submit that claims 1-21 are in condition for allowance and request that the Examiner pass this application to allowance.

If the Examiner believes that a telephone conversation with Applicant's attorney would expedite allowance of this application, the Examiner is invited to call the undersigned.

Respectfully submitted,

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Reg. No. 43,526

  
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# FIG. 3A

Annotated Marked-up Drawings

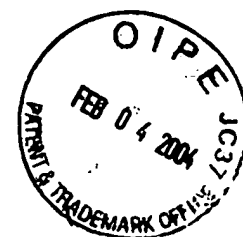
Table of Sorted Subsequences

<u>Subsequence</u>	<u>Read Number</u>	<u>Read Direction</u>
AGAG	105	F
AGCC	3	F
AGCC	61	F
AGGG	105	F
ATAG	61	F
ATCG	14	R
CCCT	3	F
CCCT	50	R
CCCT	61	F
CCTA	14	R
CCTG	1	F
CCTG	3	F
CCTG	50	R
CGCC	1	F
CTAT	14	R
CTGC	1	F
CTGC	50	R
GAGG	105	F
GCCC	3	F
GCCC	61	F
GCCT	14	R
GCGC	1	F
GCGC	50	R
GGGT	105	F
GGTT	105	F
TAGC	3	F
TAGC	61	F
TATC	14	R
TGCG	1	F
TGCG	50	R

Table of Read Pairs with Common Subsequences

<u>Read Pair</u>	<u>No. of Common Subsequences (Subsequences)</u>
(3, 61)	4 (AGCC, CCCT, GCCC, TAGC)
(3, 50)	2 (CCCT, CCTG)
(50, 61)	1 (CCCT)
(1, 3)	1 (CCTG)
(1, 50)	4 (CCTG, CTGC, GCGC, TGCG)

# FIG. 3B



**FIG. 3A**  
**Table of Sorted Subsequences**

<u>Subsequence</u>	<u>Read Number</u>	<u>Read Direction</u>
AGAG	105	F
AGCC	3	F
AGCC	61	F
AGGG	105	F
ATAG	61	F
ATCG	14	R
CCCT	3	F
CCCT	50	R
CCCT	61	F
CCTA	14	R
CCTG	1	F
CCTG	3	F
CCTG	50	R
CGCC	1	F
CTAT	14	R
CTGC	1	F
CTGC	50	R
GAGG	105	F
GCCC	3	F
GCCC	61	F
GCCT	14	R
GCGC	1	F
GCGC	50	R
GGGT	105	F
GGTT	105	F
TAGC	3	F
TAGC	61	F
TATC	14	R
TGCG	1	F
TGCG	50	R

**Table of Read Pairs with Common Subsequences**

<u>Read Pair</u>	<u>No. of Common Subsequences (Subsequences)</u>
(3, 61)	4 (AGCC, CCCT, GCCC, TAGC)
(3, 50)	2 (CCCT, CCTG)
(50, 61)	1 (CCCT)
(1, 3)	1 (CCTG)
(1, 50)	4 (CCTG, CTGC, GCGC, TGCG)

**FIG. 3B**



**FIG. 3A**  
Table of Sorted Subsequences

<u>Subsequence</u>	<u>Read Number</u>	<u>Read Direction</u>
AGAG	105	F
AGCC	3	F
AGCC	61	F
AGGG	105	F
ATAG	61	F
ATCG	14	R
CCCT	3	F
CCCT	50	R
CCCT	61	F
CCTA	14	R
CCTG	1	F
CCTG	3	F
CCTG	50	R
CGCC	1	F
CTAT	14	R
CTGC	1	F
CTGC	50	R
GAGG	105	F
GCCC	3	F
GCCC	61	F
GCCT	14	R
GCGC	1	F
GCGC	50	R
GGGT	105	F
GGTT	105	F
TAGC	3	F
TAGC	61	F
TATC	14	R
TGCG	1	F
TGCG	50	R

Table of Read Pairs with Common Subsequences

<u>Read Pair</u>	<u>No. of Common Subsequences (Subsequences)</u>
(3, 61)	4 (AGCC, CCCT, GCCC, TAGC)
(3, 50)	2 (CCCT, CCTG)
(50, 61)	1 (CCCT)
(1, 3)	1 (CCTG)
(1, 50)	4 (CCTG, CTGC, GCGC, TGCG)

**FIG. 3B**

